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| 10/500,966  | 07/08/2004  | Tsutomu Hiroki              | 255663US3PCT        | 3388             |
| 22850 7590 03/24/2009<br>OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C.<br>1940 DUKE STREET<br>ALEXANDRIA, VA 22314 |             |                             |                     |                  |
| EXAMINER<br>FORD, NATHAN K  |             |                             |                     |                  |
| ART UNIT<br>1792  |             | PAPER NUMBER                |                     |                  |
| NOTIFICATION DATE<br>03/24/2009   |             | DELIVERY MODE<br>ELECTRONIC |                     |                  |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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### Office Action Summary

**Application No.**

10/500,966

**Applicant(s)**

HIROKI, TSUTOMU

**Examiner**

NATHAN K. FORD

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 02 January 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1, 10-13, 17-21, 23, 24 and 37-50 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 10-13, 17-21, 23-24, 37-50 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Applicant's Arguments*

Acknowledged is the applicant's request for reconsideration received January 2, 2009. Claims 47-50 are new; claims 1, 17, 38-40, and 42-44 are amended.

The applicant asserts that the previously cited prior art does not teach the newly incorporated features of first and second guide slits formed on a first and second guide rails, wherein first and second support arms move along the slits.

The examiner agrees with this contention and has modified the rejections accordingly. An additional reference, Shibuya, teaching the new material has been incorporated; the revised rejections are fully elaborated below.

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 37, 45, and 47-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hofmeister, US 2001/0036398, in view of Shibuya, US 6,318,538.

Claim 1: Hofmeister discloses a substrate transport apparatus comprising the following:

- A transfer base (36) (Fig. 2);
- A support (52) for supporting the transfer base;
- First (66) and second (68) support arms disposed on the transfer base;
  - Wherein the two support arms respectively have a first (38) and second (39) support surface to retain substrates (Fig. 2);
  - Wherein the first and second support surfaces are positioned substantially on the same plane (Fig. 1A);
- A first (44) and second (46) driving motor for sliding the support arms [0029];
- A third motor (42) for revolving the transfer base [0032];
- A three-axis coaxial structure [0023-24]:
  - A intermediate drive shaft (50a);
  - An outer drive shaft (50b);

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- o A central drive shaft (50c).

Regarding the newly incorporated material, Hofmeister's support arms avail rotary mechanisms to facilitate movement rather than guide rails and slits. Nevertheless, the latter configuration is well-known in the art. Shibuya, for instance, embeds two support arms (RA) within guide slits, which are formed in turn within guide rails (2b). The guide rails are disposed atop a mobile transfer base (2a). Shibuya's transfer apparatus remedies the following deficiencies inherent to systems using multi-jointed support arms such as Hofmeister's: (1) The excessive operating volume required to accommodate rotation of the jointed robot arm and inhibit interference between the support arms; (2) The substantial height required to accommodate the vertical stacking of the arm joints (1, 50-67); (3) Protracted waiting time in the treatment parts and workpiece replacement time (3, 50ff). In light of these potential improvements, it would have been obvious to one of ordinary skill in the art at the time the invention was made to replace Hofmeister's jointed arm conveyance mechanism with a transfer apparatus of Shibuya's type. As would be apparent to one of ordinary skill, this could be accomplished by substituting Shibuya's base plate (2), first and second support arms (RA), guide rails (2b), and guide slits, for the support arms of Hofmeister. Specifically, Shibuya's base plate (2) would be disposed on Hofmeister's transfer base (36). Thus, in combination, Hofmeister's transfer base (36) would function as the bendable and stretchable support recited by the applicant's claim, and Shibuya's base plate would function as the applicant's claimed transfer base. Shibuya's transfer system further comprises first and second driving motors for independently sliding the first and second support arm (6, 46-50).

Claims 37, 45: Hofmeister provides bearings about each shaft (50a-c) to enable independent rotation [0024].

Claim 47: Shibuya's first and second driving motors may be recirculating ball screw guides (6, 52-55).

Claim 48: Shibuya's guide rails prevent the support arms from revolving, permitting only sliding movement.

Claims 10-13 and 38-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hofmeister in view of Shibuya as applied to claim 1 and in further view of Kabusikigaisya, JP 4-29380, disclosed in the IDS filed by the applicant on September 17, 2008.

Claims 10-11, 38-39: Shibuya's support arms slide parallel to each other rather than converging. Even so, as evidenced by Kabusikigaisya, support arms which converge upon sliding are well-known in the art. The reference discloses workpiece loading apparatus comprising two support arms (3, 4) formed within guide rails (6) (Fig. 2). The support arms converge toward each other when projected from the transfer base (1), thereby demonstrating the effectiveness of this configuration to accomplish rapid workpiece conveyance to a single site (Abstract). Accordingly,

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it would have been obvious to one of ordinary skill in the art at the time the invention was made to reconstitute Shibuya's guide rails to facilitate the convergence of the support arms to achieve rapid wafer conveyance to a single site.

Concerning the recitation of claim 11 required the support arms to slide along circular arcs: It would require only a nominal modification to the orientation of the guide rails to effect a slight arcuate motion of the support arms. As the applicant has not sufficiently demonstrated the criticality of arcuate over linear convergence, the applicant's recitation is merely a rearrangement of parts relative to the disclosures of the prior art, and it has been held that rearranging the parts of an invention involves only routine skill in the art (*In re Japikse*, 86 USPQ 70).

Claims 12-13, 40: Although Kabusikigaisya teaches the convergent rather than divergent sliding of the support arms, one of ordinary skill would appreciate the general applicability of Kabusikigaisya's teaching to other systems - that is, the principle of modifying the relative slide angles of first and second support arms to achieve a desired wafer conveyance pattern. Provided, for example, with a system which can accommodate the simultaneous provision of workpieces to multiple sites, it would have been obvious to one of ordinary skill to reassemble Shibuya's guide rails divergently to enhance the efficiency of wafer conveyance.

Claims 17-18, 23, 41, 46, and 49-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hofmeister in view of Shibuya as applied to claim 1 and in further view of Guo et al, US 6,079,354.

Claims 17-18: As delineated by Figure 1, Hofmeister further discloses a transfer chamber (12), a transfer mechanism (24) disposed within the transfer chamber, and a plurality of load-lock chambers (16). However, the prior art cited thus far is silent regarding the presence multiple processing apparatuses connected in parallel to both the transfer and load-lock chambers. Nevertheless, as Hofmeister's transfer mechanism is capable of operation within a cluster tool of the type claimed by the applicant, it would have to obvious to incorporate the carrying mechanism within a multi-chamber system. Thus, in supplementation, Figure 2 of Guo delineates a transfer mechanism (220) disposed within a common transfer chamber (215); both the processing (225) and load-lock (205, 210) chambers are connected to the transfer chamber in parallel to expedite processing, as is well-known in the art. All chambers operate under vacuum conditions (5, 16-20). This disclosure, then, demonstrates the suitability of disposing a transfer mechanism such as Hofmeister's within the common transfer chamber of a cluster tool. It would have been obvious to one of ordinary skill in the art at the time the invention was made to dispose the transfer mechanism of Hofmeister

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within the transfer chamber of a cluster tool as taught by Guo to achieve the predictable result of expedited substrate processing.

The rejection of claim 1 addresses those elements drawn to the structure of the transfer mechanism.

Claim 23: Hofmeister teaches a controller (11) which dictates the movements of the transfer robot [0021]. Further, Shibuya's support arms are independently controlled by a driving motor (6, 45-50). Regarding the manner of control: A recitation concerning the manner in which a claimed apparatus is to be employed does not differentiate the apparatus from prior art satisfying the claimed structural limitations.

Claims 41, 46: The rejection of claim 37 addresses these claim elements.

Claim 49: The rejection of claim 47 addresses these claim elements.

Claim 50: The rejection of claim 48 addresses these claim elements.

Claims 19-21 and 42-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hofmeister in view of Shibuya and Kabusikigaisya as applied to claims 10-13 and in further view of Guo.

The rejections of claims 10-13 and 38-40 address these claim elements.

Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hofmeister in view of Shibuya and Guo and in further view of Talmer, 6,918,731.

As articulated under the rejection of claim 1, the transfer base (2) of Shibuya is affixed to the support (36) of Hofmeister in combination. An immobile attachment of these elements would preclude the linear translation of the transfer base. Talmer, cited in supplementation for disclosing a wafer transfer system analogous to Hofmeister's, achieves linear translation merely by permitting rotation between vertically affixed elements. Linear translation is desirable, as the technique reduces the size of the conveyance footprint (6, 30-59). In light of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to rotatably affix Shibuya's base to Hofmeister's support to facilitate linear translation of the base which in turn reduces the conveyance footprint. Those claim elements drawn to a controller are addressed by the rejection of claim 23.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, THIS ACTION IS MADE FINAL. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a). A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of

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this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nathan K. Ford whose telephone number is 571-270-1880. The examiner can normally be reached on M-F, 8:30-5:00 EDT. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Cleveland, can be reached at 571-272-1418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

/N. K. F./

Examiner, Art Unit 1792

/Michael Cleveland/

Supervisory Patent Examiner, Art Unit 1792